SEQUENCE LISTING

<110> Pfizer, Inc. and Pfizer Products, Inc.

<120> NUCLEIC ACIDS AND PROTEINS OF THE MYCOPLASMA HYOPNEUMONIAE mhp3 GENE AND USES THEREOF

<130> 3153.00162/PC10555

<140> US 09/676,249
<141> 2000-09-29

<150> US Prov. 60/156,602
<151> 1999-09-29

<160> 42

<170> PatentIn version 3.2

<210> 1
<211> 1692
<212> DNA
<213> Mycoplasma hyopneumoniae

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tcatcgtaat taaaacaatt aattaggaga acaactatga aaaaaaagat aaaatgaaat 120

aaatttcttg gcttaggctt agtttttccg ctttcagcaa tcgcgacaat ctctgccgga 180

tgttgggata aagaaacaac taaagaagaa aaatcagccg ataatcaaaa taagcaaatc 240

actgatgtct caaaaatttc aggactagtt aatgaacgaa aatccgaaat tatggccgca 300

aaagctgatg caaacaaaca ttttgggcta aatatggcaa ttgtaaccgc tggtggaacg 360

gtaaatgata attcatttaa ccaatcaagt tgagaggcaa ttcaacaact tggcgctctt 420

actggaggtg agattacttc agtagatagt tcaactgctg aacttgaagg aaaatatagc 480

tcacttgcta ataccaacaa aaatgtttga gtactttctg gttttcaaca cggtgatgcg 540

ttcacaagat gattaaaaat ccctgaaaat aagcaattat ttactgaaaa aaatattatc 600

atactcggaa ttgactgaac tgatactgaa aatgtaattc caacaggtcg atatattaat 660

ttaacctata aaactgaaga agccggatga cttgcaggat atgcgaatgc ttccttttg 720

gcaaaaaaat tcccaagtga tccaactaaa agatcagcaa ttgttatcgg tggtgggatt 780

tcgccagctg taactgattt tatcgctggt tatctagccg gaattaaagc ttgaaatcta 840

aaaaattctg ataaaaaaac aaagataaca actgataaaa tcgagataaa tcttgggttt 900

gatgttcaag atacttcaac aaaagaaaga cttgaacaaa ttgcttcaaa agataaacct 960

tcaacactat tagctgtcgc tggaccactt actgaaattt tctcggatat aatcgcaaac 1020

caaaatgatc gttatctcat tggtgttgac accgaccaat cacttgttta tacaaaaact 1080

aaaaataaat ttttcacctc aattttgaaa aatttaggtt actccgtttt cagcgttctt 1140

agtgatttat ataccaaaaa atcaaattca agaaatttag ccggctttga atttggtaaa 1200

aaaagtgcaa ccgtttatct tggaattaaa gacaggtttg tcgatattgc tgatacttct 1260

ttagaaggca atgataaaaa actcgcaact gaagccattt ctgaagctaa aaaagaattt 1320

gaagaaaaaa ctaagacaat tcctgccgaa gaagttcgta aaactttaga aattccggaa 1380

atgcctgata aacaacctga taagcaacag gaaagcttag acaaactaat taccgatatt 1440

aataaaaatt aagtaagaaa aaataacaat tttttaacat tatatctttt tttagagatt 1500

aattttcttc taatttagtt taatttaata taaaattata ttaaattaaa aaaataaaaa 1560

atccggacta tttttgttcc ggatttttta tttttgtgtt actatttaat ataatgataa 1620

atcaggatta tgcaattgaa tttattcaag tctcgaaaaa atttggcagt ttttatgcca 1680

attacaaaat ag 1692

<210> 2
<211> 451
<212> PRT
<213> Mycoplasma hyopneumoniae

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1 5 10 15

Phe Pro Leu Ser Ala Ile Ala Thr Ile Ser Ala Gly Cys Trp Asp Lys
20 25 30

Glu Thr Thr Lys Glu Glu Lys Ser Ala Asp Asn Gln Asn Lys Gln Ile
35 40 45

Thr Asp Val Ser Lys Ile Ser Gly Leu Val Asn Glu Arg Lys Ser Glu
50 55 60

Ile Met Ala Ala Lys Ala Asp Ala Asn Lys His Phe Gly Leu Asn Met
65 70 75 80

Ala Ile Val Thr Ala Gly Gly Thr Val Asn Asp Asn Ser Phe Asn Gln
85 90 95

Ser Ser Trp Glu Ala Ile Gln Gln Leu Gly Ala Leu Thr Gly Gly Glu
100 105 110

Ile Thr Ser Val Asp Ser Ser Thr Ala Glu Leu Glu Gly Lys Tyr Ser
115 120 125

Ser Leu Ala Asn Thr Asn Lys Asn Val Trp Val Leu Ser Gly Phe Gln
130 135 140

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His Gly Asp Ala Phe Thr Arg Trp Leu Lys Ile Pro Glu Asn Lys Gln
145                 150                 155                 160

Leu Phe Thr Glu Lys Asn Ile Ile Ile Leu Gly Ile Asp Trp Thr Asp
                165                 170                 175

Thr Glu Asn Val Ile Pro Thr Gly Arg Tyr Ile Asn Leu Thr Tyr Lys
            180                 185                 190

Thr Glu Glu Ala Gly Trp Leu Ala Gly Tyr Ala Asn Ala Ser Phe Leu
        195                 200                 205

Ala Lys Lys Phe Pro Ser Asp Pro Thr Lys Arg Ser Ala Ile Val Ile
    210                 215                 220

Gly Gly Gly Ile Ser Pro Ala Val Thr Asp Phe Ile Ala Gly Tyr Leu
225                 230                 235                 240

Ala Gly Ile Lys Ala Trp Asn Leu Lys Asn Ser Asp Lys Lys Thr Lys
                245                 250                 255

Ile Thr Thr Asp Lys Ile Glu Ile Asn Leu Gly Phe Asp Val Gln Asp
            260                 265                 270

Thr Ser Thr Lys Glu Arg Leu Glu Gln Ile Ala Ser Lys Asp Lys Pro
        275                 280                 285

Ser Thr Leu Leu Ala Val Ala Gly Pro Leu Thr Glu Ile Phe Ser Asp
    290                 295                 300

Ile Ile Ala Asn Gln Asn Asp Arg Tyr Leu Ile Gly Val Asp Thr Asp
305                 310                 315                 320

Gln Ser Leu Val Tyr Thr Lys Thr Lys Asn Lys Phe Phe Thr Ser Ile
                325                 330                 335

Leu Lys Asn Leu Gly Tyr Ser Val Phe Ser Val Leu Ser Asp Leu Tyr
            340                 345                 350

Thr Lys Lys Ser Asn Ser Arg Asn Leu Ala Gly Phe Glu Phe Gly Lys
        355                 360                 365

Lys Ser Ala Thr Val Tyr Leu Gly Ile Lys Asp Arg Phe Val Asp Ile
    370                 375                 380

Ala Asp Thr Ser Leu Glu Gly Asn Asp Lys Lys Leu Ala Thr Glu Ala
385                 390                 395                 400
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Ile Ser Glu Ala Lys Lys Glu Phe Glu Glu Lys Thr Lys Thr Ile Pro
405 410 415

Ala Glu Glu Val Arg Lys Thr Leu Glu Ile Pro Glu Met Pro Asp Lys
420 425 430

Gln Pro Asp Lys Gln Gln Glu Ser Leu Asp Lys Leu Ile Thr Asp Ile
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Asn Lys Asn
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<210> 3
<211> 1263
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: mhp3 manipulated for in vitro expression

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aaagctgatg caaacaaaca ttttgggcta aatatggcaa ttgtaaccgc tggtggaacg 180

gtaaatgata attcatttaa ccaatcargt tgggaggcaa ttcaacaact tggcgctctt 240

actggaggtg agattacttc agtagatagt tcaactgctg aacttgaagg aaaatatagc 300

tcacttgcta ataccaacaa aaatgtttgg gtactttctg gttttcaaca cggtgatgcg 360

ttcacaagat ggttaaaaat ccctgaaaat aagcaattat ttactgaaaa aaatattatc 420

atactcggaa ttgactggac tgatactgaa aatgtaattc caacaggtcg atatattaat 480

ttaacctata aaactgaaga agccggatgg cttgcaggat atgcgaatgc ttccttttg 540

gcaaaaaaat tcccaagtga tccaactaaa agatcagcaa ttgttatcgg tggtgggatt 600

tcgccagctg taactgattt tatcgctggt tatctagccg gaattaaagc ttggaatcta 660

aaaaattctg ataaaaaaac aaagataaca actgataaaa tcgagataaa tcttgggttt 720

gatgttcaag atacttcaac aaaagaaaga cttgaacaaa ttgcttcaaa agataaacct 780

tcaacactat tagctgtcgc tggaccactt actgaaattt tctcggatat aatcgcaaac 840

caaaatgatc gttatctcat tggtgttgac accgaccaat cacttgttta tacaaaaact 900

aaaaataaat ttttcacctc aattttgaaa aatttaggtt actccgtttt cagcgttctt 960

agtgatttat ataccaaaaa atcaaattca agaaatttag ccggctttga atttggtaaa 1020

aaaagtgcaa ccgtttatct tggaattaaa gacaggtttg tcgatattgc tgatacttct 1080

ttagaaggca atgataaaaa actcgcaact gaagccattt ctgaagctaa aaaagaattt 1140

gaagaaaaaa ctaagacaat tcctgccgaa gaagttcgta aaactttaga aattccggaa 1200

atgcctgata aacaacctga taagcaacag gaaagcttag acaaacttaa ttaccgatat 1260

taa 1263

<210> 4
<211> 423
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: mhp3 manipulated for in vitro expression

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Asn Lys Gln Ile Thr Asp Val Ser Lys Ile Ser Gly Leu Val Asn Glu
20 25 30

Arg Lys Ser Glu Ile Met Ala Ala Lys Ala Asp Ala Asn Lys His Phe
35 40 45

Gly Leu Asn Met Ala Ile Val Thr Ala Gly Gly Thr Val Asn Asp Asn
50 55 60

Ser Phe Asn Gln Ser Gly Trp Glu Ala Ile Gln Gln Leu Gly Ala Leu
65 70 75 80

Thr Gly Gly Glu Ile Thr Ser Val Asp Ser Ser Thr Ala Glu Leu Glu
85 90 95

Gly Lys Tyr Ser Ser Leu Ala Asn Thr Asn Lys Asn Val Trp Val Leu
100 105 110

Ser Gly Phe Gln His Gly Asp Ala Phe Thr Arg Trp Leu Lys Ile Pro
115 120 125

Glu Asn Lys Gln Leu Phe Thr Glu Lys Asn Ile Ile Ile Leu Gly Ile
130 135 140

Asp Trp Thr Asp Thr Glu Asn Val Ile Pro Thr Gly Arg Tyr Ile Asn
145 150 155 160

Leu Thr Tyr Lys Thr Glu Glu Ala Gly Trp Leu Ala Gly Tyr Ala Asn
165 170 175

Ala Ser Phe Leu Ala Lys Lys Phe Pro Ser Asp Pro Thr Lys Arg Ser
180 185 190

Ala Ile Val Ile Gly Gly Gly Ile Ser Pro Ala Val Thr Asp Phe Ile
195 200 205

Ala Gly Tyr Leu Ala Gly Ile Lys Ala Trp Asn Leu Lys Asn Ser Asp
210 215 220

Lys Lys Thr Lys Ile Thr Thr Asp Lys Ile Glu Ile Asn Leu Gly Phe
225 230 235 240

Asp Val Gln Asp Thr Ser Thr Lys Glu Arg Leu Glu Gln Ile Ala Ser
245 250 255

Lys Asp Lys Pro Ser Thr Leu Leu Ala Val Ala Gly Pro Leu Thr Glu
260 265 270

Ile Phe Ser Asp Ile Ile Ala Asn Gln Asn Asp Arg Tyr Leu Ile Gly
275 280 285

Val Asp Thr Asp Gln Ser Leu Val Tyr Thr Lys Thr Lys Asn Lys Phe
290 295 300

Phe Thr Ser Ile Leu Lys Asn Leu Gly Tyr Ser Val Phe Ser Val Leu
305 310 315 320

Ser Asp Leu Tyr Thr Lys Lys Ser Asn Ser Arg Asn Leu Ala Gly Phe
325 330 335

Glu Phe Gly Lys Lys Ser Ala Thr Val Tyr Leu Gly Ile Lys Asp Arg
340 345 350

Phe Val Asp Ile Ala Asp Thr Ser Leu Glu Gly Asn Asp Lys Lys Leu
355 360 365

Ala Thr Glu Ala Ile Ser Glu Ala Lys Lys Glu Phe Glu Glu Lys Thr
370 375 380

Lys Thr Ile Pro Ala Glu Glu Val Arg Lys Thr Leu Glu Ile Pro Glu
385 390 395 400

Met Pro Asp Lys Gln Pro Asp Lys Gln Gln Glu Ser Leu Asp Lys Leu
405 410 415

Ile Thr Asp Ile Asn Asn Leu

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<210> 5
<211> 602
<212> DNA
<213> Mycoplasma hyopneumoniae

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aacgcatcac cgtgttgaaa accagaaagt actcaaacat ttttgttggt attagcaagt 120

gagctatatt ttccttcaag ttcagcagtt gaactatcta ctgaagtaat ctcacctcca 180

gtaagagcgc caagttgttg aattgcctct caacttgatt ggttaaatga attatcattt 240

accgttccac cagcggttac aattgccata tttagcccaa aatgtttgtt tgcatcagct 300

tttgcggcca taatttcgga ttttcgttca ttaactagtc ctgaaatttt tgagacatca 360

gtgatttgct tattttgatt atcggctgat ttttcttctt tagttgtttc tttatcccaa 420

catccggcag agattgtcgc gattgctgaa agcggaaaaa ctaagcctaa gccaagaaat 480

ttatttcatt ttatcttttt tttcatagtt gttctcctaa ttaattgttt taattacgat 540

gactttcaat tatttttaa taaattaatt tttattttac attttctatt atattcaaaa 600

ac 602

<210> 6
<211> 200
<212> PRT
<213> Mycoplasma hyopneumoniae

<400> 6

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1 5 10 15

Asn His Leu Val Asn Ala Ser Pro Cys Trp Lys Pro Glu Ser Thr Gln
20 25 30

Thr Phe Leu Leu Val Leu Ala Ser Glu Leu Tyr Phe Pro Ser Ser Ser
35 40 45

Ala Val Glu Leu Ser Thr Glu Val Ile Ser Pro Pro Val Arg Ala Pro
50 55 60

Ser Cys Trp Ile Ala Ser Gln Leu Asp Trp Leu Asn Glu Leu Ser Phe
65 70 75 80

Thr Val Pro Pro Ala Val Thr Ile Ala Ile Phe Ser Pro Lys Cys Leu
85 90 95

Phe Ala Ser Ala Phe Ala Ala Ile Ile Ser Asp Phe Arg Ser Leu Thr
100 105 110

Ser Pro Glu Ile Phe Glu Thr Ser Val Ile Cys Leu Phe Trp Leu Ser
115 120 125

Ala Asp Phe Ser Ser Leu Val Val Ser Leu Ser Gln His Pro Ala Glu
130 135 140

Ile Val Ala Ile Ala Glu Ser Gly Lys Thr Lys Pro Lys Pro Arg Asn
145 150 155 160

Leu Phe His Phe Ile Phe Phe Phe Ile Val Val Leu Leu Ile Asn Cys
165 170 175

Phe Asn Tyr Asp Asp Phe Gln Leu Phe Phe Asn Lys Leu Ile Phe Ile
180 185 190

Leu His Phe Leu Leu Tyr Ser Lys
195 200

<210> 7
<211> 14
<212> PRT
<213> Mycoplasma hyopneumoniae

<220>
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<223> Xaa is any amino acid

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<210> 8
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Oligonucleotide

<400> 8

Ala Trp Val Thr Ala Asp Gly Thr Val Asn
1 5 10

<210> 9
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Oligonucleotide

<400> 9

Ala Ile Val Thr Ala Asp Gly Thr Val Asn Asp Asn Lys Pro Asn Gln
1 5 10 15

Trp Val Arg Lys Tyr
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<210> 10
<211> 30
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<220>
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<220>
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<222> (1)..(30)
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<210> 11
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
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<400> 11
tgttgagcwa aagaaacwac waaagaagaa 30

<210> 12
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide

<220>
<221> misc_feature
<222> (1)..(27)
<223> n is any nucleotide

<400> 12
tgrgtnacng cngayggnac ngtnaay 27

<210> 13

<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide

<400> 13
tgagtwacwg cwgatggwac wgtwaat 27

<210> 14
<211> 26
<212> DNA
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<220>
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<222> (1)..(26)
<223> n is any nucleotide

<400> 14
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<210> 15
<211> 26
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<220>
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<400> 15
attsacsgts ccatcsgcsg tsactc 26

<210> 16
<211> 21
<212> DNA
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<220>
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<400> 16
tttgagacat cagtgatttg c 21

<210> 17
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<220>
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<400> 17
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<210> 18
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<400> 18
ctatctactg aagaatctca cc 22

<210> 19
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<210> 20
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<400> 20
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<210> 21
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<210> 22
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<400> 22
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<210> 23

<211> 18
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<210> 24
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<220>
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<400> 24
gaaatgcctg ataaacaacc 20

<210> 25
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
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cttcagaaat ggcttcagtt gc 22

<210> 26
<211> 25
<212> DNA
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<220>
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<400> 26
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<210> 27
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<220>
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<210> 28
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<220>
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<210> 29
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
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<400> 29
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<210> 30
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
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<400> 30
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<210> 32
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<223> Oligonucleotide

<400> 32
tttattaaaa aataattgaa agtcatcg 28

<210> 33
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<210> 34
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<210> 35
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<210> 36
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<210> 37
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<400> 38
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<210> 39
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<400> 39
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<400> 40
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<210> 41
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<212> PRT
<213> Mycoplasma hyorhinis

<400> 41

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20 25 30

Gly Lys Ile Ile Arg Ile Phe Asp Asn Ser Phe Val Lys Asp Arg Gln
35 40 45

Ala Glu Ile Glu Lys Ala Lys Asn Phe Asp Phe Asn Thr Val Leu Leu
50 55 60

Thr Ala Gly Gly Thr Val Gln Asp Lys Ser Phe Asn Gln Ser Ile Trp
65 70 75 80

Glu Ala Val Leu Glu His Tyr Asp Gln Ile Glu Lys Thr Thr Asn Leu
85 90 95

Asp Arg Val Ser Gln Glu Thr Asn Asn Gln Ser Glu Leu Ile Gly Lys
100 105 110

Tyr Lys Asn Phe Leu Asn Gly Asn Lys Asn Val Trp Ile Leu Thr Gly
115 120 125

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Phe Gln Gln Gly Gln Glu Phe Pro Lys Phe Leu Lys Gln Thr Asp Ser
    130                 135                 140

Asn Gly Lys Lys Tyr Ser Asp Leu Leu Ala Glu Lys Lys Val Ile Ile
145                 150                 155                 160

Val Ala Val Asp Trp Asp Leu Ser Lys Glu Asp Lys Asp Leu Ile Lys
                165                 170                 175

Ala Gly His Phe Ile Ser Leu Leu Tyr Lys Thr Glu Glu Ala Gly Phe
            180                 185                 190

Ile Ala Gly Tyr Ala Ser Ser Lys Phe Leu Ala Tyr Lys Phe Pro Asn
        195                 200                 205

Asp Glu Ala Lys Arg Thr Ile Ala Pro Phe Gly Gly Gly His Gly Ala
    210                 215                 220

Gly Val Thr Asp Phe Ile Ala Gly Phe Leu Ala Gly Ile Ala Lys Tyr
225                 230                 235                 240

Asn Asn Asp Asn Pro Thr Ala Lys Val Thr Ile Ser Asp Asn Asn Ile
                245                 250                 255

Asn Ile Asp Thr Gly Phe Ile Ser Asn Asp Lys Thr Ala Thr Phe Ile
            260                 265                 270

Asn Gly Ile Val Asn Lys Ser Ser Leu Val Leu Pro Val Ala Gly Ser
        275                 280                 285

Leu Thr Ser Ser Val Val Asp Ala Ile Lys Lys Ser Asn Lys Asp Thr
    290                 295                 300

Lys Tyr Leu Ile Gly Val Asp Thr Asp Gln Ser Lys Ile Phe Ser Pro
305                 310                 315                 320

Ala Thr Val Phe Phe Thr Ser Ile Glu Lys His Leu Gly Arg Thr Ile
                325                 330                 335

Tyr Gln Val Leu Thr Asp Ile Trp Leu Lys Lys Glu Asp Ser Lys Phe
            340                 345                 350

Leu Gly Ser Phe Arg Ser Phe Lys Leu Thr Asn Pro Ala Asn Ala Thr
        355                 360                 365

Val Tyr Lys Gly Ile Ser Asp Asp Phe Val Gly Val Ser Asn Ser Thr
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370 375 380

Val Ala Asp Ala Asp Lys Val Lys Ala Gln Glu Phe Leu Asn Glu Ala
385 390 395 400

Thr Ala Asp Phe Lys Lys Gln Ile Gln Ala Asn Pro Thr Asn Tyr Lys
405 410 415

Ser Val Leu Gly Ile Pro Thr Met Leu Ile Asn Asp Asn Asp Ala Lys
420 425 430

Asp Asn Glu Lys Ala Ser Leu Phe His Phe Asp Asn Trp Gln Thr Tyr
435 440 445

Trp Ala Phe His Ser Arg Phe Ile Asn
450 455

<210> 42
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Artificial amino acid sequence

<400> 42

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